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SANITARY REPORT FROM MEXICO AND CENTRAL AND SOUTH AMERICA—  
YELLOW FEVER ROUTES.

*Report upon the sanitary condition of Central American and Colombian towns, with special reference to their geographical position, and the possible routes by which yellow fever is conveyed from one to another, and the dangerous lines of communication with the United States.*

SIR: The history of yellow fever in Mexico antedates the arrival of Cortez many years, and there has been no apparent improvement in the fever situation since the first settlement by the Spanish. Vera Cruz was located opposite the island of San Juan de Ulua, after two other settlements had been abandoned on account of the fever.

There is no doubt that Vera Cruz has been infected since its foundation, but the official records only date from 1866. Since that time 7,266 deaths have been recorded from the disease. The appended mortality table will show the annual mortality for the past thirty-four years. Vera Cruz is situated in about 19° 20' north latitude, and is built on a low sandy beach just a few feet above sea level.

The town is so level that the heavy rains would flood the lower stories of the houses were it not for the porous condition of the soil. The general sanitary condition of the town is bad. There is no drainage, no sewerage, and an inadequate water supply. The cesspools are not emptied until they run over or are complained of by the neighbors. The houses are built of brick, adobe, and coral rock, mostly coral rock. The porous condition of the walls of the buildings renders it impossible for thorough disinfection and fumigation to be effective, and at the same time affords an excellent refuge for microbes.

It would seem that the 30,000 inhabitants would have become immune to the fever before now, considering the mortality and the tens of thousands of cases that have occurred in the city; but the death rate among the working classes keeps up the wages to the alluring point and induces the nonimmunes from abroad and the high altitudes of the interior, and so keeps a constant supply of fuel for the flames.

The prison of Ulua is another constant source of infection, as the place is infected and nonimmune prisoners are being constantly brought from the interior. The same can be said of the barracks and the soldiers. From a maritime standpoint the harbor is perfect, having a narrow entrance to the southeast and the entrance being protected by coral reefs further to sea. The harbor is completely surrounded by a sea wall that renders it like a mill pond in all sorts of weather. The mouth is wide enough, and the rise and fall of tide sufficient to keep the water of the harbor fresh and clean. There are two drains which empty into the harbor, but their output is not detrimental to the health conditions of the shipping. During the dry season the discharge is small, and during the wet season the sewerage is so well diluted that it is rendered inoffensive.

From a quarantine standpoint the harbor of Vera Cruz is dangerous to all United States territory susceptible to yellow fever infection. There is constant intercourse between the shipping and the shore, and as the infection ashore is constant, the chances of infection of the shipping are always present. Luckily for the health interests of the Gulf States, their quarantine regulations have deflected all freight and passenger traffic to the northern ports. A few lumber schooners ply between Vera Cruz and Pascagoula, Miss., and New Orleans has about

4 steamers a month from Mexican ports. Occasionally a vessel will go to Mobile via the Ship Island Quarantine, or Tampa via Tortugas.

The bulk of the passenger traffic goes to or through Havana, there being 3 regular passenger lines of steamers on that route. The danger of infection of Havana from this source is a problem that can be solved only by an absolute quarantine, or the hearty cooperation of the Mexican health authorities. The direct steamers make the trip in about three days, and the steamers that touch at the intermediate Mexican ports about four days. The disinfection of baggage and the immunity of passengers are safeguards, but the inefficiency of disinfection and the doubtful veracity of the passengers add to the danger.

The railroads are a source of dangerous communication that requires constant vigilance. The Texas border is crossed by 3 roads, each one advertising theirs as the quickest route to the United States. The time distance from Vera Cruz to New Orleans is about four days by rail. The Marine-Hospital inspectors on the border can furnish all information about the amount of travel over the railroads, and the possible chances of infection from that source. There is no doubt that Texas was saved last summer from the fever by the inspectors on the border.

In the accompanying map I have endeavored to show the possible routes by which yellow fever might be conveyed into United States territory, not only from Mexico but from all Central America.

On December 14, 1899, I left Vera Cruz on the inspection tour of Central and South American ports as per instructions in your Department letter of November 28. I reached Coatzacoalcos the following day, and after a few days I went to Tehuantepec and then to Salina Cruz.

Coatzacoalcos, the Gulf terminus of the Tehuantepec Railroad, has about 1,000 inhabitants, and is situated on the Tehuantepec River, about a half mile from its mouth. It is built on sand dunes overlooking the river and Gulf. It is composed of frame or wooden houses and is scattered over considerable ground. The streets are wide and regularly laid out, but are without pavement or sidewalks. There is no sewerage nor waterworks, and no garbage department. Water is obtained from shallow wells or cisterns. The wells seem to have been dug with due regard to the proximity of the closets. The scavengers are the buzzards, dogs, and hogs, and I must admit that they do the work thoroughly.

The river is wide and deep, with a daily tide and strong current. It affords excellent shelter for light draft vessels and the port is considered a very healthy port. There is no history of contagious diseases in the town except of a few cases of yellow fever during the past summer. There have been many deaths from fevers, but they were called paludic, pernicioso, and calentura. The physicians of the place are divided as to the correct name of the fever, but I think it safe to say that there were some deaths from yellow fever.

Coatzacoalcos has two or three vessels a week from Vera Cruz, and is also connected by a land route. The land route requires two or three days, but it is only about twelve hours by sea, distance being 120 miles. The Tehuantepec Railroad connects Coatzacoalcos with Salina Cruz on the Pacific coast. Along the line of the road there are many small villages, Tehuantepec being the largest.

Tehuantepec has 12,000 inhabitants and is one of the oldest towns in Mexico. It certainly is dilapidated looking, and its antiquity is undoubted, but considering that it has survived wars, floods, and earthquakes innumerable, and has lived through epidemics of cholera, smallpox, beriberi, and yellow fever, it is really wonderful that it is still in existence.

It is situated on the river bearing same name about 12 miles from the Pacific Ocean, and is built of adobe and cane houses with tiled and thatched roofs. It is clustered on the hillside, and is naturally well drained. It was built without regard to street formation and before sewers and water works were known. The water supply is obtained from a few wells, but the majority of the inhabitants bring their water from the river in jars and barrels. The majority of the population are women, and with the exception of a few foreigners and some Mexicans, the population is composed of Tehuantepec Indians.

In December, 1882, an epidemic of Asiatic cholera occurred, and by March of the following year 297 deaths were recorded. An epidemic of yellow fever followed the cholera, and when it finished, the town was about depopulated. From an old resident who lived through both epidemics I learned that the mortality statistics were not kept at the time, and that the mortality in Tehuantepec and vicinity must have been in the thousands, judging from the information that he received at the time.

With the exception of some epidemics of smallpox and measles, there have been no contagious diseases reported until during the past summer. In June the fever made its appearance, and on Christmas day I saw the thirtieth reported victim of the disease. The number of cases and deaths that occurred on the isthmus during the past year will never be known. There are few physicians in the territory.

Salina Cruz, the Pacific terminus of the railroad, is a small village composed of about 50 houses built on the sand beach between a lagoon and the sea. It has about 200 inhabitants, and is of no commercial importance. There has been yellow fever in the place, but there are no records kept in the town that would be of use. Four steamers a month constitute the shipping of the port—2 steamers north and 2 south.

From a quarantine standpoint the Isthmus of Tehuantepec is of no importance at present, but the firm of S. Pearson & Son has contracted with the Mexican Government to reconstruct the railroad and to build a deep-water harbor at each terminus. This work will require the importation of many nonimmune workmen, and, at the same time, will increase the shipping at Coatzacoalcas. As the fever was epidemic on the isthmus during the past summer, and no effort was made in the way of disinfecting the infected localities, it is reasonable to suppose that it will make its appearance whenever there is an influx of new material. An English physician, who was brought out by the contractors, died of the fever a few days after arriving at his post.

When this road is finished, and the ports opened for deep draft vessels, and a bid is made for the interoceanic freight and passenger traffic, then the isthmus will become a most dangerous point.

At Salina Cruz I took a Pacific Mail steamer for San José, Guatemala. On the steamship *Costa Rica* I found that the ship's surgeon could tell much about the prevalence of yellow fever on the Pacific coast of Central America. He admitted, however, that he had never seen a case of the fever that he knew of, and did not think that he would know a case if he saw it, but was positive that he would not report a case if he discovered one aboard. This steamer stopped a day at Tonalá, and San Benito in Mexico, and Ocos and Champerico in Guatemala, before reaching San José.

All of these ports are open roadsteads, built on a sandy beach, with lagoons in the rear. They are built without any street formation, and are without any municipal improvements. Ocos and Champerico have railroads and piers extending out over the surf. The roads extend to the high altitudes of the interior and are used principally to bring out

coffee. The health conditions of both are about the same ; epidemics of paludic fever and some deaths from perniciosa. Tonalá has had yellow fever during the past summer, and there were a few cases in December.

As far as the health interests of the United States are concerned, these ports are of no importance. The time distance to the nearest American port is eight or ten days. There is little communication, except by San Francisco or via Panama, and those routes require eighteen or twenty days.

San José, Guatemala, is the Pacific port of entry for the capital of the republic. It is a village of about 1,000 inhabitants, composed of frame houses in different stages of decay. It is built on a sand beach, with the Pacific in front and a lagoon behind. There is an artesian well which supplies the majority of the inhabitants with water. There is no garbage department, no sewerage, and only sand beds for streets. In 1895 there was yellow fever in San José and many of the interior towns, but the fact is denied by the authorities. During nine months of the year there is a prevalent fever that is called perniciosa. Many of the cases die of black vomit, and present many of the symptoms of yellow fever. I would not consider yellow fever endemic in this port, but it certainly becomes epidemic. If there are any sanitary or quarantine laws they are rigidly ignored. The Government does not maintain a quarantine physician at the port, and if they had one he would be handicapped for want of a station and disinfection apparatus.

The Central Railroad connects San José with Guatemala City. The length of the road is about 75 miles, and it requires about eight hours to make the trip.

Guatemala City, the capital of the Republic, is a city of about 50,000 inhabitants, and is situated upon a plateau about 6,000 feet above sea level. It is Spanish in architecture, and is just like all Central American cities that are situated away from the coast. In fact a description of one will fit them all except in size and population. There is no information obtainable in regard to the public health. In the republic I was unable to obtain any official information in regard to the prevalence of yellow fever or smallpox.

Some years ago the construction of the Guatemala Northern Railroad was commenced, and it has been built out as far as El Rancho. It will (when finished) connect Guatemala City with Puerto Barrios, the Atlantic port. The unconstructed gap in the road is about 75 miles, and is a mountainous trail that requires about two days to cross. The trip could be made from San José via Guatemala City by rail, then mule-back to El Rancho, and rail to Puerto Barrios, then steamer to New Orleans in seven days. This is one of the routes by which infection can be carried into the United States, and when the Guatemala Northern road is completed the danger will be increased. Puerto Barrios is also the outlet for that part of San Salvador next to the Guatemala border. Zacapa is the station where the trail joins the railroad. I know that yellow fever is endemic in San Salvador, but it is impossible to ascertain the health conditions existing along the border of the two countries. Santa Ana, in Salvador, is about three days from Zacapa. There are no quarantine restrictions or laws in Guatemala. Last season, when the fever was so prevalent in Salvador, there were no precautions taken to keep out the disease. From Puerto Barrios there is a steamer a week to New Orleans and every two weeks one to Mobile.

## SALVADOR.

From San José it is about eight hours by steamer to Acajutla in Salvador. Acajutla is the principal port of Salvador, and is connected with the interior by a railroad. It is a dirty little village situated on a bluff headland overlooking the Pacific. There is nothing to it except the railroad station, custom-house, barracks, and a conglomeration of the dirtiest shacks imaginable. It has a population of about a thousand, including soldiers and all. There are no quarantine regulations, in fact, there is not a physician in the town. Nobody seems to have lived in the place for any length of time, yet everything looks antique. This is another place where the perniciousa is prevalent, and every season there are some victims to the disease. After leaving Acajutla I visited Sonsonata, Santa Ana, La Ceiba, Santa Tecla, San Salvador City, and La Libertad.

I found that a case of yellow fever was landed in La Libertad in the summer of 1895, and that the disease became epidemic throughout the entire republic. The first case was brought from Guayaquil, Ecuador, on a German steamer. The mortality in the republic in 1895 ran up into thousands. There are no means of ascertaining the death date on account of the infection having extended to the small villages and outlying farms. The following year the disease was nearly as bad, but since 1896 there have been no epidemics. The disease is endemic, and the only victims now are the foreigners and the natives from the high altitudes. There is no isolation of the cases, no quarantine, and no disinfection. Luckily this focus of infection is not in close relation with the infectable territory of the States. The Puerto Barrios route is the closest, and one taking that route would have to be able-bodied and devoid of baggage. Mr. Jenkins, the consul at San Salvador, is an immune, and keeps posted as to the health conditions of the republic.

## NICARAGUA.

Corinto and San Juan del Sur are the ports of Nicaragua, but as they have no connection with the Atlantic side there is no danger of infection coming from that source. It is impossible to secure any statistics of the health conditions of these ports that are official, and the information furnished by the inhabitants is so contradictory that it is useless. The pernicious fever is prevalent in them all, and some of the cases have died of black vomit. In Corinto there were some cases of yellow fever in 1895, but the number and the number of deaths I was unable to obtain. These ports should be considered in case the Nicaraguan canal is built, at least when the construction is commenced. They will afford excellent openings for the infection to be conveyed to the construction camps. Permanent stations and hospitals should be erected at the extremities of the canal, not only for the protection of the men employed in construction, but to be prepared for the Pacific and Oriental traffic whenever the two oceans are connected.

## COSTA RICA.

Punta Arenas, the Pacific port of Costa Rica, is a small village of several hundred inhabitants, built on a sandy point into the Golfo de Nicoya. It is composed of wooden houses and shacks, without any sewerage or sanitary arrangements. Yellow fever has been endemic in this port for many years. Just when it became infected is beyond the memory of the oldest inhabitants. It was the principal port of the

republic before the construction of the railroad from San José to Port Limon, and most of the imports and exports passed through the town. In those days the passengers for Europe and the United States went via Panama, and immigration came over the same route. At present the principal port is Port Limon, on the Atlantic side. The history of the fever in Punta Arenas is just as contradictory as the information that is received in the other republics.

The port physician would be run out of the town if he reported a case, so his statistics are rather suspicious. The Government would like to have all cases reported, but when the physician is dependent upon the population for a support he is not liable to make any report that would jeopardize his livelihood. The hotel proprietors and merchants of the place are responsible for this state of affairs. The steamship communications amount to about 1 vessel a week. They come from the Central American ports above and from Panama below. There is a quarantine physician who boards the incoming vessels.

Calentura, the Spanish word meaning fever, is the favorite diagnosis in Punta Arenas and the other lower coast towns in Costa Rica. The official statistics for Punta Arenas for 1898 give the total mortality as 367. Twenty-one deaths were attributed to fiebre and 75 to calentura. None from yellow fever.

In 1899 the total mortality was 220, 1 from yellow fever, 2 from perniciosa, 4 from remitente, and the majority of the remainder divided between calentura and fiebre.

There is a projected railroad that is being built from Punta Arenas to San José, but the construction has been finished only as far as Esparta. From Esparta there is a cart road to Alajuela, the distance being covered in twelve hours with a good mule.

Esparta and other villages along the road have been the seat of several outbreaks of yellow fever, and every year some cases would find their way to Alajuela. Until last summer the cases imported into Alajuela either died or got well, and no case was ever recorded where the infection was spread to even the inmates of the house of the patient.

Alajuela has 4,000 inhabitants, and is about 3,000 feet above the sea level. It is built, like all interior towns of Central America, of adobe and brick buildings, cobbled streets, and has poor sanitary arrangements. It has daily railroad communications with San José and Port Limon, and cart and mule communication with Punta Arenas. The first case of yellow fever that occurred in the town last summer was in the person of Rafael Dobles, who contracted the disease in Punta Arenas and died of black vomit on May 7. Thirty deaths were reported from the fever during the year, and 1 case was reported sometime in January, 1900. This epidemic caused considerable uneasiness among the population of the adjacent cities, for the old theory that yellow fever would not exist or become epidemic in the altitudes above 2,000 feet had been exploded.

The Government took active steps to prevent the spread of the disease, and by disinfection, isolation, and quarantine the epidemic did not assume any great proportions. The loss of life, commerce, and business should have enough effect to indelibly impress the Government with the fact that all infected localities in the republic are a constant menace to its prosperity.

Along the line of the railroad from La Junta to Limon is infectable territory, and it was infected in the summer of 1898. The old line—that is, the branch road from La Junta to Guapiles—was also infected at the same time. There were many cases and deaths during 1898, and

there has never been any disinfection of the houses in which the patients died.

At present there is no physician in the second circuit of Limon or the territory adjoining the old line road, so it is impossible to ascertain the character of the prevailing diseases.

Port Limon is the prettiest and cleanest town on the coast south of the Rio Grande. It is regularly laid out with wide streets. There are a good sewerage system and water works. The streets are macadamized and are kept clean. There is a port physician who boards the incoming vessels and accepts the bills of health without question. There is a quarantine station on an island opposite the city.

The quarantine laws are peculiar. If an infected vessel arrives, the quarantine physician reports the matter to the governor, and he in turn wires the president of the republic for instructions. Last summer when an Atlas steamer arrived from Barranquilla with a case of yellow fever aboard she was ordered away from the dock and not allowed any communication with shore. This occurred two days after the arrival of the vessel. No physician was allowed aboard to see the patient, and when the president was heard from, the ship was ordered out of the port. The vessel went to Kingston, Jamaica, but the patient died enroute. I consider Port Limon an infected port, and yellow fever endemic. The old hotels, building No. 99, and many other of the buildings in the town are excellent incubators for the disease. The population of 3,000 are mostly Jamaica negroes. The white population would not amount to 200. The negroes are not subject to the fever, and the rest of the population are immunes. I don't think that 25 people could be found in the town who have not had the fever or lived through one or more epidemics. Yellow fever curtails the fruit business with the States, and everyone within and about Limon lives on the banana business. Port Limon is in direct communication with Colon, Bocas del Toro, Cartagena, and Barranquilla. It is twenty-five hours from Punta Arenas and eight hours from Alajuela, and passengers can come from Panama and Colon in twelve hours. Cartagena and Barranquilla are about two days away. There are weekly steamers to New Orleans and New York. The New Orleans steamers go direct in about five days. The New York steamers go via Jamaica and take about ten days. Occasional steamers touch at Port Limon on their way to other Central American and Mexican ports.

#### PANAMA.

The city of Panama, a town of 15,000 inhabitants, is situated upon an elevated point of land jutting into Panama Bay. The town is irregularly laid out, with narrow, crooked streets, cobblestoned, and filthy. The houses are Spanish in architecture in the least bad part of the city, and the rest of the town is made up of wooden shacks in all stages of decay. There are 2 small sewers in the place, but they are connected with only a few of the best houses. There is an insufficient water supply of inferior water, piped in from a river some distance back in the country.

The population is a cosmopolitan set, the leavings of the old canal construction. Sixty per cent being Jamaica negroes accounts for most of the filth in the town.

The harbor is situated at the head of the bay, about 2 miles from the town, and is protected by several small islands. The sanitary condition of the anchorage is naturally perfect, being swept by a 16-foot tide daily. The island nearest the shipping is inhabited by the employees of the steamship companies, laborers, stevedores, and coal passers.



There is constant communication between this island and Panama, and daily intercourse with the shipping. Yellow fever is endemic in Panama, sporadic cases occurring at intervals, and becoming epidemic whenever there is an immigration of nonimmunes, during favorable atmospheric conditions.

Panama is the point of distribution and collection of all passengers and freight of the Pacific coast destined across the isthmus. It is the key to the quarantine situation of the west coast, and if it was not a focus of infection itself, many epidemics on the Atlantic side could be averted by proper quarantine regulations.

The houses of Panama are so constructed and of such material, and so filthy, that a general conflagration would be the only safe means of disinfection. I can not conceive of any other means by which the infection could be eradicated.

There are 4 regular lines of steamships that enter and sail from Panama each week, and tramps and sailing vessels drop in occasionally. The territory tributary to Panama is from Valparaiso, Chile, to San Francisco, Cal., Asiatic goods being transshipped in San Francisco.

There are no quarantine restrictions in Panama, not even an inspector. I entered the port twice, once from Central America and once from Guayaquil, Ecuador, and neither time was the vessel inspected or boarded by an inspector.

#### COLON.

Colon, the northern terminus of the Panama Railroad, is built in a swamp on made ground, and is populated by 3,000 people, 70 per cent being Jamaica and other kinds of negroes. The property of the railroad and canal company is drained and sewerred, and is situated on the water front. Everything about the company's property looks clean and well kept, but the rest of the town is not so clean or well kept.

The houses are of wood and generally dirty. There are no sanitary arrangements of any kind, and the population is crowded into small rooms as only Jamaica negroes can live.

The streets are in fair condition, macadamized, and are on a higher plane than the adjoining lots. In the wet season pools are formed under the houses, and serve as breeding places for frogs if nothing else. Rain water is collected in barrels and cisterns, and, during the wet season, the water supply is good and sufficient. During the dry season many of the cisterns run dry, and the water supply is hauled in from Monkey Hill in tank cars by the railroad. This supply is not good.

No history of the sanitary condition or the mortality of Colon can be had. Some of the old inhabitants tell blood-curdling tales of the death rate during the flush days of the canal construction, but the old inhabitants will not do for statistical purposes. It was well known that the death rate was enormous, but it would be interesting to know just what it was.

Colon has been burned on several occasions, the last time in 1896, with the loss of the government offices and all of the records. Since that time, records have been kept of all deaths and their causes. In 1897 there were 212 deaths from all causes, 62 from malarial fevers, and 15 from yellow fever. In 1898 there were 222 deaths from all causes, 80 from malarial fevers and 8 from yellow fever. In 1899 there were 236 deaths from all causes, 51 from malarial fevers and 2 from yellow fever.

The population in Colon is practically immune, or there would be yellow fever in the town all the time. There are seasons of the year when the atmospheric conditions are such that the infection is not pro-

pagated, and the absence of a case now and then in an immune community does not signify that the infection does not exist.

The distance from Colon to Panama is about 41 miles, and there is practically one village all the way across the isthmus.

The passenger traffic across this road during 1897 and 1898 amounted to 227,728. Many of these were through passengers from New York to San Francisco, and vice versa.

The steamship communication between Colon and the United States consists of the Panama Railroad Steamship Company to New York, and the Harrison, West India Pacific, and Hamburg-American Lines, and an occasional Prince steamer to New Orleans. The vessels to New Orleans generally go via some Central American or Mexican port. Other lines that touch at Colon are the Royal Mail from Southampton, the French Line from Havre, and the Spanish Line from the Mediterranean. Sailing vessels are constantly dropping in from foreign and United States ports. The inclosed map gives a better idea of the communications than any that I can write.

#### GUAYAQUIL.

Guayaquil, the chief port of Ecuador, is situated on a mud flat on the west bank of the Guayaquil river, about 30 miles above its mouth. It is in latitude  $2^{\circ} 12''$  south, practically under the equator. Without exception it is the filthiest town that I ever saw. The streets are quagmires of filth, garbage, and mud, veneered over with a scum of green slime, giving off odors distinctive of Guayaquil. Most of the streets are liquid, and permeate back under the houses and meet each other in the middle of the block.

The 2 streets next to the river are paved, also several blocks connecting these streets. There is also pavement between the rails of the street-car tracks, which run through many of the streets.

Seeing that it was impossible to drag a cart through the streets, I wondered how the disposition of garbage was managed. Having been told that the garbage was collected at night, I walked about town to see how it was done. On one of the side streets I saw the department at work. There was a gondola, street-car size, with 2 mules and a driver, going slowly down the street. On each sidewalk was an assistant that followed the car along, and when he came to a garbage box or receptacle that had been placed on the sidewalk, he would walk to the edge of the walk and throw the contents at the car. Sometimes some of it went in the car, but there was much that went to perpetuate the odors of the streets.

The houses are built of wood and bamboo, plastered with mud, without any special architectural design, highly inflammable, generally dirty, mostly 2 stories, with tiled or corrugated roofs, and shelters about 30,000 people.

There is a good system of water works, and the water is good in quantity and quality. The river is wide and deep, with a 15-foot daily tide. The shipping anchors in midstream, and from time of arrival to departure is infested with laborers, boatmen, and hotel runners. There is a quarantine inspection station down the river where vessels are boarded, but not inspected by the officer. The quarantine laws of Ecuador are complete in every detail, but are executed with lack of zeal.

In 1892 (about) during an epidemic of cholera in Chile all of the ports as far up as Mexico were closed to vessels from south of Callao, Peru.

Guayaquil has been wiped out more than once and it is a mystery why the town was ever rebuilt. It has been sacked by pirates, shaken down by earthquakes, depopulated by disease, and burned more than once. The last big fire destroyed all of the business portion of the town, disinfecting about half of the city. This fire occurred on October 5, 1896, and destroyed all of the municipal records, and the archives of the United States and British consulates. If the past records were no better than those kept at present, there was not much lost. The following are the official statistics taken from the municipal records:

	1897.	1898.	1899.	Total.
Deaths from all causes.....	3,806	2,576	2,765	9,147
Deaths from fevers.....	2,276	a 1,103	1,043	4,422

a One of yellow fever.

The 1 officially admitted death was a sporadic case.

From the British consul I learned that the British steamship *Golden Gate*, loaded with coal, arrived from Cardiff on December 3, 1896, and by January 13, 1899, the whole crew had had the yellow fever, with the result of 6 deaths. Several of the citizens told me of cases and deaths that had occurred in their families or among friends in the past few years, but among the officials it is impossible to get them to admit a case.

The physicians admit that if a number of nonimmunes were imported, the fever would break out. If a person can survive one year in Guayaquil, I can not imagine why he should ever die of any kind of fever. The Guayaquil fever might not be yellow, and it might not be contagious, but it is the easiest fever to catch that I ever saw. I caught it and am certain that it is not malarial. I had just passed through a very bad epidemic of yellow fever in Vera Cruz and thought I was immune, but when my temperature kept above 103° for three days, and albumen made its appearance, and the other text-book symptoms appeared, I felt certain that it was yellow fever.

In my opinion Guayaquil is the most quarantinable place on the Pacific coast. I did not have an opportunity to see any cases of fever in the town.

There are 3 lines of steamers running between Guayaquil and Panama, 2 going direct and 1 coastwise. The direct steamers take three days for the voyage and the coast steamer about one week.

#### BARRANQUILLA.

Barranquilla, one of the most important cities of Colombia, is situated on the west bank of the Magdalena River, about 15 miles above its mouth. It is built on a sandy plain only a few feet above sea level, and is fairly well laid out. The houses in the center of the town are Spanish in architecture, and built of adobe and brick. The majority of the dwellings are native shacks, built of cane, plastered with mud, with thatched roofs. The streets are narrow, paved spasmodically, not very dirty, and are generally nothing but sand beds. The sidewalks are entirely Spanish. There is a system of water works that supplies an inferior quality, and small quantity of water. The majority of the inhabitants use well water.

The porous soil and the buzzards are the salvation of the place. There

are no sewers, cesspools answering the purpose for the best class of houses, but there are many houses that have no closets.

From a Central American standpoint, the town is in a good sanitary condition, but it is due entirely to natural conditions.

Mr. W. Irvin Shaw, the United States consul in Barranquilla, who has lived in the town since 1897, has kept complete records of the mortality of the city, and to him I am indebted for the following statistics:

The total mortality for the last six months of 1896 was 466; for the year of 1897 the total mortality was 909; for the year of 1898 the total mortality was 965; for the year of 1899 the total mortality was 1,028; first three months of 1900 the total mortality was 253.

Deaths from yellow fever were reported during the following months: October, 1898, 4 deaths; November, 1898, 5 deaths; December, 1898, 4 deaths; January, 1899, 1 death; February, 1899, 3 deaths; March, 1899, 1 death; June, 1899, 1 death; August, 1899, 2 deaths; October, 1899, 1 death; November, 1899, 2 deaths; December, 1899, 1 death; January, 1900, 1 death, and March, 1900, 2 deaths.

From these statistics it would seem that the winter months were the favorable months for the disease in this locality. The histories of yellow fever epidemics and the mortality during any of the epidemics can not be secured. I do not think that there are any. The old inhabitants admit there have been many severe epidemics, and many thousands of deaths from the disease. In my opinion the town is infected, and is, in itself a focus of the disease, but its principal danger lies in the fact that it is in constant communication with an infected territory without any quarantine restrictions.

The Magdalena River is the outlet for a vast territory, populated by a semicivilized people, rotten with disease. No one knows which is the most prevalent disease in the republic. Leprosy stands high on the list and smallpox holds a good second. Yellow fever is reported as high up the river as Honda, and on the coast from Buenaventura on the Pacific to Santa Marta on the Caribbean Sea.

Barranquilla, strictly, is not a port, for it is impossible for vessels of any draft to cross the bar at the mouth of the river. Sabanilla, or more correctly speaking, Puerto Columbia, is where the vessels land in order to receive and discharge passengers and cargoes. There are an iron pier, a light-house, a barracks for soldiers, and several saloons, that comprise the port. It is connected with Barranquilla by rail, two or three trains daily each way. There is no quarantine station or lazaretto, and no means of disinfection or fumigation. In case a vessel arrives with a quarantinable disease aboard, she is simply ordered out of the port, that is, if the officials find out that there was any disease aboard.

#### SANTA MARTA.

Santa Marta, a small port of about 3,000 inhabitants, is situated on the coast, about 60 miles east of Barranquilla. I did not visit the place on account of the irregular communications. From inquiries and facts obtained in Barranquilla and Cartagena I am satisfied that the place is infected. Dr. Edward M. Merrins, the surgeon of the Cartagena railroad, had just received a letter from a friend stating that a young Englishman, who lived on a coffee plantation about 16 miles from Santa Marta, died of yellow fever on the plantation. This death occurred about March 1 in the high lands near the port. Santa Marta is the base of supplies of these farms, and it was there that the disease was supposed to have been contracted.

## CARATGENA.

Cartagena is an old Spanish city of about 20,000 inhabitants, built on a low, sandy point between the sea and a lagoon. It is intensely Spanish in construction, with narrow, crooked streets and spasmodic sidewalks. The houses are 2 and 3 stories, with the regulation balconies overlooking the streets. The houses are generally built around a hollow square, inclosing an open patio. The first thing that strikes the attention is the amount of whitewash that has been washed off the walls. Some of the buildings are painted, and some show a pathetic attempt at adornment with colored borders and fronts. The favorite color is blue, but there are yellows from the color of a ham cover to a light canary.

The streets are generally clean, but the courts and patios of the majority of the houses are filthy.

There is a good water supply, but no sewers. There is a scavenger department, augmented by the buzzards, that is very effective. Within the walls of the city is decidedly unsanitary. The walls of the houses are composed principally of coral rock, and this feature, in my opinion, condemns any town that lies within the yellow fever zone, not from the simple fact that it is coral, but from the fact that coral rock is so constructed that it is an ideal refuge for infection, microbes, and filth, and at the same time it is incapable of being disinfected. Cartagena is a walled city. The walls are massive, and in places are hollow, and serve as prisons. The prison that I saw in one of the walls, from a sanitary point of view, is a disgrace to the country. Suffice it to say that the prisoners were not allowed out of the cell on any account. The accumulation of fecal matter in an unventilated cell in a tropical climate, is not conducive to good health.

Dr. Merrins, the surgeon of the Cartagena Railroad, is compiling the health statistics of Cartagena from the official records, and to him I am indebted for the following information:

"During 1899 there were 528 deaths from all causes. One hundred and two were from fevers. From pernicious and remittente there were 96 deaths, 64 adults and 32 children. Five deaths from yellow fever were reported during the year. Thirty-four children and 4 adults died of tetanus. One hundred and ninety-two of the total deaths occurred among children under 1 year of age."

There are no histories of the past epidemics of yellow fever, but Dr. Merrins is making an effort to get some reliable data of the disease, which he will publish when finished.

Cartagena is a focus of infection that is not dangerous to the health interests of the United States directly, but the close connection that it has with Colon, Port Limon, and Graytown makes it dangerous on account of the traffic between the United States and the latter ports.

There are no direct steamers to the States from Cartagena, but there is an occasional steamer to Porto Rico.

The harbor of Cartagena is in the lagoon, and the shipping is about a half of a mile from the city. There are no dwellings about the wharf, and everything about the shipping seems to be in a good sanitary condition.

There is a railroad that connects the town with the Magdalena River. This road is about 65 miles long, and with its steamboats on the river brings Cartagena in close connection with the interior.

*Steamship connections and routes.*

On the Pacific the Pacific Mail is the most extensive line—that is, from San Francisco to Panama.

The map appended to this report will convey a clearer idea of the steamship communications, the infected territory, and the possible routes of yellow fever than a disconnected description.

*Conclusions.*

In every coast town of Central America and Mexico there are occasional deaths from pernicioso. (This word, pernicioso, is the equivalent to the terms malignant malaria, hemorrhagic malaria, and chagres.) During certain seasons of the year it becomes epidemic. The average mortality is over 60 per cent, and at times it is higher. The initial symptoms of an ordinary case of pernicioso and those of yellow fever are very much alike, and the average coast doctor is not able to differentiate them. I do not deny the prevalence of the pernicioso on the coast, but I am sure that many of the so-called cases of pernicioso are yellow fever. From a quarantine standpoint I would consider all coast towns wherein pernicioso was prevalent as infected, and would keep it quarantined until the fever was thoroughly investigated by responsible physicians.

The prevalence of chagres and yellow fever on the Isthmus of Panama during the construction of the canal by the French should be borne in mind should the United States Government undertake to build this canal.

There is an infected territory from ocean to ocean, and the importation of a number of nonimmune workmen would be the signal for an outbreak of an epidemic of yellow fever. The yellow-fever infection is there, and the chagres will come when the excavations commence. The whole isthmus should be disinfected before any workmen are imported, and a thoroughly equipped, strictly enforced, maritime quarantine maintained at Panama and Colon. This should be done not only for the protection of the army of workmen that will be necessary for such an undertaking, but for the protection of the infectable States that will be in direct communication with the isthmus just as soon as timber and supplies are needed for the construction of the canal.

The route of the Nicaraguan Canal is not infected with yellow fever, and there is no history of any infection having been in the country for many years. There should be suitable quarantine stations maintained at each end of the canal, and they should be the first things constructed. It matters not which route is selected, there will be a rush of people from all over Central and South America, coming from infected localities, and bringing the infection with them.

With the exception of the spasmodic attempt in Costa Rica last summer, there has never been any attempt to suppress yellow fever in any of the republics of Central or South America or Mexico. When the fever became epidemic in Alajuela during the past season, it was creeping too close to the capital for comfort. All of the wealth, the aristocracy, the politicians, and the Government officials live in the cities in the high altitudes of the interior, and do not pay much attention to the coast towns. The coast towns and ports are generally the unhealthy localities and the people of the high lands dread to even pass through them on their way to other countries. This fear of the coast fever accounts for the indifferent class of physicians furnished by the Governments at the ports. The climatic conditions, filthy hotels, lack of provisions, social

banishment, and meagre salary are not calculated to induce good men to accept the positions.

The fruit business on the Central American coast has become quite extensive during the past few years, and on account of the perishable condition of the bananas the steamers and their cargoes have been granted special quarantine regulations. The banana business has reached such proportions that it becomes necessary for the fruit ports to be put in a thorough sanitary condition, and kept so, or the regulations should be curtailed. The fruit ports are a constant source of danger, even under the constant observation of an inspector. They should maintain strict quarantine against all infected and suspected places, and I am confident that this is not done.

[Inclosure.]

VERA CRUZ, MEXICO.

*Official mortality report from yellow fever from 1866 to 1900.*

Years.	Months.												Total deaths from yellow fever.	Total from all causes.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
1866.....	0	0	2	11	26	40	54	48	20	12	21	20	254	.....
1867.....	18	4	16	54	64	42	8	32	38	17	11	8	212	.....
1868.....	7	6	7	30	40	16	26	20	21	9	2	3	187	.....
1869.....	0	0	0	2	0	0	1	2	1	2	2	2	9	.....
1870.....	0	0	0	0	0	0	0	0	1	3	5	2	11	.....
1871.....	3	0	1	6	29	113	71	17	10	15	2	4	271	.....
1872.....	2	2	4	5	14	45	53	39	29	11	5	6	215	.....
1873.....	1	1	0	0	3	1	19	58	59	44	20	10	222	.....
1874.....	1	2	0	0	2	3	11	24	7	12	11	6	79	.....
1875.....	7	2	4	11	29	93	118	105	41	13	2	1	425	.....
1876.....	0	1	1	0	0	2	7	9	6	6	1	3	34	.....
1877.....	0	1	0	0	4	7	54	144	164	77	50	27	528	.....
1878.....	16	4	0	1	7	58	113	110	62	45	24	7	448	.....
1879.....	2	2	2	1	1	1	2	1	3	0	0	0	21	.....
1880.....	2	0	1	0	0	0	3	10	42	92	103	254	1,366	.....
1881.....	24	21	27	29	94	235	183	39	22	25	17	3	723	1,882
1882.....	1	1	2	1	5	11	7	14	8	3	5	12	72	1,155
1883.....	5	3	7	16	90	261	200	67	39	81	21	7	747	1,910
1884.....	3	2	0	0	3	2	4	3	17	44	39	19	136	1,268
1885.....	6	5	8	5	21	25	84	84	48	19	14	9	328	1,313
1886.....	7	3	7	12	14	31	19	26	25	37	13	10	208	1,159
1887.....	0	0	1	0	0	1	0	0	1	1	0	0	4	1,083
1888.....	0	0	0	0	0	0	0	0	1	2	0	0	3	1,104
1889.....	0	0	0	0	1	0	0	0	0	0	1	0	2	1,300
1890.....	0	0	0	0	0	1	1	5	0	6	9	19	41	1,320
1891.....	1	4	2	3	10	39	40	19	13	18	20	10	179	1,361
1892.....	0	2	1	7	20	41	75	53	27	13	10	10	260	1,488
1893.....	5	1	6	8	17	32	29	8	9	11	5	0	131	1,406
1894.....	0	0	0	8	39	55	44	38	15	5	3	3	210	1,618
1895.....	5	1	1	2	12	23	40	36	17	3	3	0	143	1,414
1896.....	0	0	0	0	0	0	0	0	0	0	0	0	0	1,438
1897.....	0	0	0	0	0	0	0	4	0	1	1	0	2	1,625
1898.....	0	0	0	0	0	0	0	9	24	39	32	23	127	2,086
1899.....	9	5	7	8	101	246	90	68	31	14	5	7	670	3,583
Total .....	133	75	107	224	647	1,442	1,390	1,079	759	557	436	328	7,156	.....

#### NETHERLANDS.

#### *Report from Rotterdam.*

ROTTERDAM, NETHERLANDS, *May 29, 1900.*

SIR: I have the honor to make the following report for the week ended May 26, 1900: Seven vessels were inspected and received bills of health. The steamship *Statendam*, of the Holland-American Line,